Research Paper
Sexual Function in Women With Recurrent Pregnancy Loss

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ABSTRACT

Background: Recurrent pregnancy loss (RPL), as one of the most critical issues in reproductive health, is followed by emotional trauma, social problems, financial concerns, and disruption of marital relations. This study aimed to investigate sexual function in married women with a history of RPL.

Methods: This cross-sectional study was conducted on 130 women with a history of RPL who were referred to the recurrent miscarriage clinic of Avicenna Fertility Center in Tehran, Iran, from November 2018 to February 2019. Data were collected using the demographic characteristics form and the female sexual function index (FSFI). Statistical analysis was carried out using SPSS software, version 16. The Kruskal-Wallis and Mann-Whitney tests were used to determine the relationship between the sexual function of the women and their sociodemographic characteristics. The significance level was set at $P<0.05$.

Results: The Mean±SD score of the female sexual function was 26.59±5.73, and 50% of the women had sexual dysfunction (score ≤28). Sexual desire was the most prevalent sexual disorder (72.3%), while vaginal lubrication had the lowest prevalence (5.4%). No relationship was found between the women's sociodemographic characteristics and their sexual function ($P<0.05$).

Conclusion: The results of this study confirm the need to provide sexual health-related counseling to women who suffer from RPL and refer them to fertility centers.

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Highlights

• Recurrent pregnancy loss may damage couples' relationships and increase sexual dysfunction.

• In this study, half of the women with recurrent pregnancy loss had impaired sexual function.

• Women with recurrent pregnancy loss predominantly experienced decreased sexual desire, while they did not have much problem in terms of vaginal lubrication. No relationship was found between recurrent pregnancy loss and the sociodemographic characteristics of these women.

Plain Language Summary

Recurrent abortion or recurrent pregnancy loss, as one of the most critical issues in the reproductive health of women, is followed by emotional trauma, social problems, financial concerns, and disruption of marital relations. This study aimed to investigate sexual function in married women with a history of recurrent pregnancy loss. The results showed that half of these women had impaired sexual function and experienced decreased sexual desire, while they did not have much problem in terms of vaginal lubrication. No relationship was detected between the sexual function of the women and their sociodemographic characteristics. The results confirm the need to provide sexual health-related counseling to women who suffer from repeated pregnancy loss and refer them to fertility centers.

1. Introduction

Recurrent pregnancy loss (RPL) is distinct from infertility and is defined as the spontaneous and consecutive loss of two or more clinical pregnancies before 24 weeks of gestation (ESHRE Guideline Group on RPL, 2018; Zegers-Hochschild et al., 2009). European Society of Human Reproduction and Embryology (ESHRE) defined primary RPL as RPL without a previous pregnancy (viable pregnancy) lasting more than 24 weeks of gestation, while secondary RPL is described as an episode of RPL after one or more previous pregnancies progressing more than 24 weeks of gestation. Accurate estimation of the prevalence of RPL seems complicated, but most of the studies have reported the prevalence rate to be 1-2% (ESHRE Guideline Group on RPL, 2018).

Although the loss of pregnancy is considered a traumatic event (Adolfsson et al., 2012), the experience of abortion varies in different women. Factors, such as personality traits, cultural and religious background, and socioeconomic status have been reported to affect the psychological consequences of miscarriage (Major et al., 2009). Some of the psychological challenges in this regard involve emotional trauma, social problems, financial concerns, disruption of marital relations, and sexual dysfunction (Kicia et al., 2015; Serrano & Lima, 2006). Women suffering from RPL experience the lower health-related quality of life and higher levels of anxiety and depression than women without a history of miscarriage, which may cause sexual dysfunction in these women.

Several studies have suggested conflicting results regarding sexual function and marital relations in women with a history of RPL (Serrano & Lima, 2006; Fok et al., 2006; Francisco et al., 2014; Oindi et al., 2019; Agrawal et al., 2012). For instance, the results of a study conducted in China indicated that women with recurrent miscarriages were significantly more likely to experience sexual dysfunction compared to women with a history of a single miscarriage (Fok et al., 2006). Furthermore, research performed on Portuguese pregnant women indicated that women with a history of recurrent spontaneous miscarriage have experienced impaired sexual function more significantly than those without this condition (Francisco et al., 2014). Conversely, a recent study demonstrated no association between fertility status and the prevalence of female sexual dysfunction (Oindi et al., 2019). A study conducted in India also showed that couples' marital relations had no changes after a miscarriage, and spousal support was even higher after a miscarriage (Agrawal et al., 2012). Another study in Portugal indicated that marital relations were not adversely affected by recurrent miscarriages and even, discussing sexual issues with the spouse was facilitated after miscarriage, which could be considered as a beneficial effect of recurrent miscarriage on the couples' marital and intimate relations (Serrano & Lima, 2006).

Because discussing sexual function may be considered taboo, it is not considered for patient evaluation (Erbil, 2011). In addition, women in low- and middle-income countries have limited access to post-abortion family planning, education, and counseling regarding sexual and reproductive health (Rogers and Dantas, 2017).

Therefore, special attention must be paid to the post-abortion care, evaluation, and treatment of sexual issues.

Limited data are available on RPL in Iran, and relevant studies have mainly focused on the etiologies or outcomes of this condition. However, fertility problems and female sexual dysfunction are common in various ethnic groups in Iran, and fertility problem is considered the leading cause of divorce and marital dissatisfaction (Abedinia et al., 2012; Ranjbar et al., 2015). In Iranian culture, childbearing is a positive value and the ultimate goal for couples so that the practice of childbearing defines the concept of family. Therefore, women who have problems conceiving face many limitations and psychological pressures (Behjati-Ardakani et al., 2017). Sexual dysfunction is highly prevalent in infertile Iranian women (64.3%) (Omani-Samani et al. 2019); therefore, women with a history of RPL are not excluded in relation to this disorder. RPL has been considered the "orphan" of infertility because this condition is often neglected in fertility research (Carp, 2014). No prior studies have investigated the prevalence of sexual dysfunction in women with a history of RPL in Iran. Considering the contradictory results about sexual function and marital relations in women with a history of RPL and the impact of cultural and religious background and socio-economic status on the psychological consequences of RPL, the present study was conducted to examine sexual function in women with a history of RPL.

2. Materials and Methods

This cross-sectional study is part of more extensive research that evaluated the association between depression and sexual function in women with a history of RPL (Azin et al., 2020). To assess their sexual function, 130 women with RPL history referred to the Recurrent Miscarriage Clinic of Avicenna Fertility Center in Tehran, Iran, from November 2018 to February 2019 were enrolled. This semi-public sector operates under the Iranian Academic Center for Education, Culture, and Research (ACECR) supervision, and provides specialized fertility care in Iran. The subjects were selected consecutively according to their convenient access to the clinic, and the sampling process ended when the entire sample was reached.

The sample size was determined at a 95% confidence level and estimation accuracy of d=2. In addition, the standard deviation was estimated based on Mintz et al.'s study (Mintz et al., 2012). Therefore, the minimum required sample size was estimated to be 86 subjects based on the following formula. Although the minimum sample size to estimate the main variable was 86, at least ten samples were considered for each demographic variable

in order to investigate the relationship between sociodemographic characteristics and FSFI. Accordingly, 130 subjects were included in this study.

Inclusion criteria were non-pregnant married women aged 18 to 45 and literate, having a history of two or more consecutive failed pregnancies confirmed by ultrasound or histopathological examination before week 24 of pregnancy, at least six months have passed since the last miscarriage, no history of alcohol/drug abuse, and no mental disorders or diseases associated with increased risk of sexual dysfunction (e.g., diabetes, cardiovascular diseases, and cancers).

Because significant depression and anxiety have been demonstrated in the first month following RPL (Farren et al., 2018), participants with an interval of fewer than six months since their last miscarriage were excluded from the study. Women who had undergone infertility treatments including induction ovulation (IO), intrauterine insemination (IUI), in vitro fertilization (IVF), and intracytoplasmic sperm injection (ICSI) in the past three months were also excluded because infertility treatments could cause stress and interfere with the sexual relationship (Bakhtiari et al., 2016; Starc et al., 2019).

Study participants anonymously completed a demographic questionnaire and the female sexual function index (FSFI) in approximately 20 minutes in a private room at the clinic.

The demographic questionnaire included information concerning the women's age, educational level, occupational status, duration of the miscarriage, contraceptive use, type of RPL, the interval from the last miscarriage, the procedure used to terminate the previous pregnancy, and the number of pregnancies (gravidity).

The FSFI-19 is widely utilized in clinical practice as a screening tool concerning female sexual dysfunction and in clinical trials as an outcome measure (Neijenhuijs et al., 2019; Goldfarb et al., 2013). Rosen first introduced this 19-item index to assess six domains of sexual function, including sexual desire (two items), sexual arousal (four items), vaginal lubrication (four items), orgasm (three items), sexual satisfaction (three items), and pain (three items). It is scored based on a Likert scale from 1 to 5. There is a zero option in responding to 15 of the items to indicate either "no sexual activity" or "did not attempt intercourse" within the past four weeks. The total FSFI score (2 to 36) is obtained by summing the scores of the six domains. Higher scores indicate better sexual functioning. For all six domains of the FSFI, Cronbach's alpha value was ≥0.82 (Rosen, 2000).

In the present study, the total score of ≤28 was interpreted as sexual dysfunction, while higher scores were described as satisfactory sexual function. The sensitivity analysis for the Persian version of FSFI determined the score of 28 as the cutoff point (sensitivity: 83%, specificity: 82%). The cutoff points determined for the domains of the Persian version of FSFI were as follows: sexual desire (3.3), sexual arousal (3.4), vaginal lubrication (3.7), orgasm (3.8), sexual satisfaction (3.4), and pain (3.8). The reliability of the Persian version of the tool was confirmed using Cronbach's alpha coefficient, which was estimated at ≥0.70 for the entire questionnaire and its domains (Mohammadi et al., 2008). In the current study, Cronbach's alpha coefficient for the total scale was 0.82 and for each subscale ranged from 0.71 to 0.86, representing a good internal consistency.

Statistical analysis was carried out using the SPSS software version 16 (SPSS Inc., Chicago, IL, USA). To assess the normal distribution of the study data, the Kolmogorov-Smirnov normality test was conducted, according to which the data met the required assumptions for conducting the nonparametric tests. The relationship between sexual function and the participants' characteristics was assessed using the Kruskal-Wallis test or Mann-Whitney test. The significance level was set at $P<0.05$.

3. Results

A total of 130 married women with a history of two or more failed pregnancies, as confirmed by ultrasonography or histopathologic examination, were enrolled in the study. The Mean±SD age of the participants was 31.53±5.11 years, and the majority had academic education (54.6%). Most of the participants were housewives (73.1%), and their Mean±SD duration of marriage was 8.9±4.13 years. According to the obtained results, 70.8% of the participants experienced primary RPL. The Mean±SD interval since the last miscarriage was 15.48±12.22 months before the study.

The Mean±SD gestational age in the previous abortion was reported as 8.18±3.42 weeks, and 85.3% of these cases occurred before week 12 of pregnancy. The demographic characteristics and reproductive history of the participants are presented in Table 1. The results of the Kruskal-Wallis test indicated no correlations between sexual function and the participants' characteristics (Table 1).

According to the FSFI, 50.0% of the women with a history of RPL had lower scores than the cutoff point, while 50.0% obtained higher scores. The Mean±SD score of the FSFI was 26.59±5.73 (≤28). The status of sexual function and its domains, including sexual desire, sexual arousal, orgasm, sexual satisfaction, and pain are presented in Table 2. According to the findings, sexual desire was the most prevalent sexual disorder (72.3%), while vaginal lubrication had the lowest prevalence (5.4%).

4. Discussion

The present study provided new information on the prevalence of sexual dysfunction in women with a history of RPL in a fertility center in Tehran. According to the current study's findings, the mean score of sexual dysfunction was 26.59±5.73, which was below the determined cutoff point. Moreover, half of the participants demonstrated impaired sexual function, which is a considerable proportion. Similar to women with other fertility problems, women with a history of RPL may also experience sexual dysfunction. Couples may experience stress due to trying to conceive quickly and having a set schedule for sexual activities. Fertility problems may also damage the couple's relationships and increase marital difficulties (Carp, 2014). According to a study in Portugal, the total mean score of sexual function in pregnant women with a history of RPL was 16.4±1.9 (Francisco et al., 2014), which is lower than the present study. However, it may be due to a decline in sexual function during pregnancy (Serati et al., 2010). In another study that evaluated the sexual function of women visiting gynecology clinics, the prevalence of sexual dysfunction in women with a history of at least two miscarriages was reported as 45.5%. The researchers stated that this indicates a higher prevalence of the condition compared to women without a miscarriage or those who have had a single miscarriage (Hamidi Madani et al., 2018).

In recent studies conducted in Iran, infertile women have also experienced highly impaired sexual function (Omani-Samani et al., 2019; Direkvand-Moghadam et al., 2015; Shahraki et al., 2018). However, according to a review study regarding the prevalence of sexual dysfunction in the general population in Iran, 52% of women had sexual dysfunction (Ghiasi and Keramat, 2018). In general, due to the high prevalence of female sexual dysfunction in the general population in Iran, the sexual function of women with RPL may not be significantly different from the general population. Therefore, it is necessary to pay attention to the socio-cultural aspects of sexuality in Iran, because Iranian women's

Table 1. Participants' characteristics and their relationship with subscales of the female sexual function index (FSFI)

Individual Characteristics		No. (%)	Median(IQR)ᵉ	P*
Age (y)	≤25	10(7.7)	26.8(4.1)	†0.212
	26-29	38(29.2)	26.35(5.5)	
	30-34	42(32.3)	28.95(5.77)	
	≥35	40(30.8)	29.2(5)	
Educational level	High school or lower	17(13.1)	24.7(5.8)	†0.098
	Diploma	41(32.3)	28.85(4.53)	
	Higher education	71(54.6)	27.9(5.7)	
Occupational status	Housewife	95(73.1)	27.9(5.4)	‡0.669
	Employed	35(26.9)	28.9(4.3)	
Duration of marriage (y)	≤5	24(18.5)	27.2(5.73)	†0.466
	6-9	66(50.8)	28.45(5.32)	
	≥10	27(20.8)	28.6(5.65)	
Contraceptive use	Yes	64(49.2)	28.9(5.43)	‡0.46
	No	66(50.8)	27.3(5.23)	
Type of RPL	Primary	92(70.8)	27.95(5.38)	‡0.444
	Secondary	38(29.2)	28.7(4.58)	
The interval from the last miscarriage (month)	6-12	66(50.8)	28.8(4.18)	†0.561
	13-23	33(25.4)	28(5.85)	
	≥24	31(23.8)	27.1(7.6)	
Gestational age of last miscarriage (Week)	<12	110(85.3)	27.95(5.15)	‡0.78
	≥12	19(14.7)	29.1(6.4)	
The procedure used to terminate the last pregnancy	Surgical (D&C)	38(29.2)	27.3(6.3)	†0.616
	Medical (Misoprostol)	39(30)	28.9(5.1)	
	Spontaneously	53(40.8)	27.4(4.7)	
Having children	No	92(70.8)	27.95(5.38)	‡0.444
	Yes	38(29.2)	28.7(4.58)	
Number of Pregnancies (Gravida)	3	64(49.2)	27.95(5.47)	†0.508
	4	42(32.3)	27.75(5.8)	
	≥5	24(18.5)	29.2(4.83)	

€: Interquartile range; †: Kruskal-Wallis Test; ‡: Mann-Whitney; *: Significance level at P<0.05.

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Table 2. The status of participants' sexual function and its domains (N=130)

Domains	No. (%)		Median (IQR)
	Sexual Dysfunction	Satisfactory Sexual Function	
Desire (1.2-6)	94(72.3)	36(27.7)	2.4(1.2)
Arousal (0-6)	19(14.6)	111(85.4)	4.5(0.9)
Vaginal lubrication (0-6)	7(5.4)	123(94.6)	5.4(0.98)
Orgasms (0-6)	14(10.8)	116(89.2)	5.2(1.2)
Satisfaction (0.8-6)	13(10)	117(90)	5.2(1.2)
Pain (0-6)	24(18.5)	106(81.5)	5.2(1.6)
Total (2-36)	65(50)	65(50)	28.05(5.28)

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description of sexual norms is different from women in Western countries in some ways, and emotional intimacy is the main aspect of Iranian women's sexuality and a prerequisite for a fruitful sexual life. Because the healthcare system in Iran is not well-suited to solving sexual problems, and individuals often use informal sexual education (Farnam et al., 2014), our findings highlighted the need to provide effective sexual and reproductive healthcare services to all Iranian women. Women with a history of RPL should also be mainly targeted for sexual counseling in infertility centers.

In the present study, sexual desire was the most common complaint regarding the sexual function of the participants, while vaginal lubrication was the least frequent. In contrast, in the study conducted in Portugal, a comparison of women with a history of recurrent miscarriage with those without miscarriage was indicative of sexual dysfunction in all the domains of sexual function, except for sexual desire (He et al., 2019). However, a systematic review indicated that poor physical health, low life satisfaction, and a sense of guilt about previous miscarriages are the risk factors for sexual desire disorders in women (McCool-Myers et al., 2018). Low libido is strongly linked to depression (Basson & Gilks, 2018), common in women with RPL (Kolte et al., 2015). Furthermore, it has been reported that loss of sexual desire is higher among women who had repeated induced abortions. In a study on sexual dysfunction after a first-trimester induced abortion in a Chinese population, the women with an abortion history reported a greater willingness to engage in sexual behavior without love than those without an abortion history (Fok et al., 2006). It has been proposed that sexual pleasure is often not prioritized by subfertile couples due to concerns regarding

the loss of a pregnancy or the pressure for childbearing, which could in turn adversely affect sexual desire. The pressure to perform sexual activity within a specified period (intercourse in the ovulation period) for conception may also lead to the lack of sexual desire or sexual pleasure in women. Therefore, sexuality and reproductive capacity are closely correlated in subfertile couples (Lewis and Black, 2006), and fertility problems may lead to changes in their sexual self-esteem, sexual relations, and sexual function (Tao et al., 2011). Although healthcare providers may inquire about couples' sexual activity and practices, there is often limited discussion regarding sexuality unless the patient raises the issues. Sexuality should not be examined only for pregnancy and childbirth purposes (Banaei et al., 2020), and subfertile couples' satisfaction and sexual pleasure should also be addressed in fertility clinics. Considering that the lack of sexual desire has been reported to be the most common concern in the general population (Ghiasi & Keramat, 2018), pregnant women (Jamali & Mosalanejad, 2013), and infertile women (Omani-Samani et al., 2019), establishing a systematic framework for the provision of sexual health services to all women seems to be essential.

Our results showed that sexual function and its domains had no significant correlations with demographic characteristics. Similarly, in a study in Denmark, gestational age and the procedure used to terminate the last pregnancy had no significant associations with female sexual function (Boesen et al., 2004). Moreover, a study conducted in Italy indicated that women undergoing medical termination of pregnancy had higher FSFI scores than the women undergoing surgical termination of pregnancy, which suggests the effect of

the procedure used to terminate the last pregnancy on sexual function. However, this finding is inconsistent with the results of the present study. On the other hand, the mentioned study demonstrated that women's age is not correlated with their sexual function, which is in line with the findings of the current research. The effect of age on female sexual function is unclear (McCool-Myers et al., 2018), and further studies are required to examine the predictors of sexual function, specifically in women suffering from RPL.

In the present study, diminished vaginal lubrication had the lowest prevalence. Vaginal lubrication and sexual satisfaction are the least recognized areas of sexual dysfunction in the general population in Iran (Hamidi Madani et al., 2018), and in a review study conducted by Ghiasi and Keramat, orgasmic disorders were reported to have the lowest prevalence in the women of the reproductive age (Ghiasi & Keramat, 2018).

One of the limitations of the current study was including patients from one referral recurrent miscarriage clinic, which might raise questions about the generalizability of the findings. In addition, women with a history of RPL usually refer to fertility centers less often, and this contributed to the reduction of the sample size. Therefore, the findings of the present study should be interpreted and used with more caution. In addition, the lack of a comparison group can be mentioned as another limitation.

5. Conclusion

The findings of this study showed that half of the women with RPL had impaired sexual function. Also, these women predominantly experienced decreased sexual desire, while they did not have much problem in terms of vaginal lubrication. No relationship was found between RPL and the sociodemographic characteristics of these women. Further investigations are recommended to be conducted in order to compare the sexual function of women with RPL history with the general population or infertile women. Since sexual dysfunction is common in Iran, the results cannot necessarily be attributed to RPL. Given that psychological functioning, sexual satisfaction, and erectile function may impair in men with RPL partners (Zhang et al., 2016), similar studies need to be conducted in Iran to assess the sexual function of the men whose partners experience RPL. The women with RPL predominantly experienced decreased sexual desire, while their vaginal lubrication was not problematic. Sexual health clinics should be established in infertility centers to provide sexual healthcare services to strengthen infertile couples' marital relations. This study may contribute to drawing the attention of policymakers toward sexual issues in women with RPL history. Appropriate interventions to reduce sexual dysfunction in women with RPL are highly recommended.

Ethical Considerations

Compliance with ethical guidelines

The ethics committee of the Iran University of Medical Sciences (IR.IUMS.REC 1396.31743) approved the research proposal. The objectives of the research were explained to the participants and informed written consent was obtained from all the women who participated in the study.

Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

References

Abedinia, N., et al., 2012. Comparison of predisposing and effective factors on divorce application between men and women. *Journal of Family and Reproductive Health*, 6(2), pp. 65-72. [Link]

Adolfsson, A., Johansson, C. & Nilsson, E., 2012. Swedish women's emotional experience of the first trimester in a new pregnancy after one or more miscarriages: A qualitative interview study. A*dvances in Sexual Medicine*, 2(3), pp. 38-45. [DOI:10.4236/asm.2012.23007]

Agrawal, S., Unisa, S. & Agrawal, P., 2012. Psychological problems after abortion: findings from rural Haryana India. *The Journal of Family Welfare,* 58, pp. 1-8. [Link]

Azin, S. A., et al., 2020. Association of depression with sexual function in women with history of recurrent pregnancy Loss: Descriptive-correlational study in Tehran, Iran. *Fertility Research and Practice,* 6(1), pp. 21. [DOI:10.1186/s40738-020-00089-w] [PMID] [PMCID]

Bakhtiari, A., Basirat, Z. & Nasiri-Amiri, F., 2016. Sexual dysfunction in women undergoing fertility treatment in Iran: Prevalence and associated risk factors. *Journal of Reproduction & Infertility,* 17(1), pp. 26-33. [PMID]

Banaei, M., et al., 2020. A comparison of sexual function in primiparous and multiparous women. *Journal of Obstetrics and Gynaecology*, 40(3), pp. 411-8. [DOI:10.1080/01443615.2019.1640191] [PMID]

Basson, R. & Gilks, T., 2018. Women's sexual dysfunction associated with psychiatric disorders and their treatment. *Women's Health,* 14, pp. 1745506518762664. [PMID] [PMCID]

Behjati-Ardakani, Z., Navabakhsh, M. & Hosseini, S. H., 2017. Sociological study on the transformation of fertility and childbearing concept in Iran. J*ournal of Reproduction & Infertility,* 18(1), pp. 153-61. [PMID]

Boesen, H. C., et al., 2004. Sexual behavior during the first eight weeks after legal termination of pregnancy. *Acta Obstetricia Et Gynecologica Scandinavica,* 83(12), pp. 1189–92. [DOI:10.1111/j.0001-6349.2004.00494.x] [PMID]

Carp, H. J., 2014. *Recurrent pregnancy loss: Causes, controversies, and treatment*. Boca Raton: CRC Press. [DOI:10.1201/b17855]

Ashraf, D. M., Ali, D. & Azadeh, D. M., 2015. Effect of infertility on sexual function: A cross-sectional study. *Journal of Clinical and Diagnostic Research: JCDR,* 9(5), pp. QC01–3. [PMID]

Erbil, N., 2011. Prevalence and risk factors for female sexual dysfunction among Turkish women attending a maternity and gynecology outpatient clinic. *Sexuality and Disability,* 29, pp. 377-86. [DOI:10.1007/s11195-011-9202-z]

ESHRE Guideline Group on RPL., 2018. ESHRE guideline: Recurrent pregnancy loss. *Human Reproduction Open,* 2018(2), pp. hoy004. [PMID] [PMCID]

Farnam, F., et al., 2014. Compare the effectiveness of PLISSIT and sexual health models on Women's sexual problems in Tehran, Iran: a randomized controlled trial. *The Journal of Sexual Medicine*, 11(11), pp. 2679-89. [DOI:10.1111/jsm.12659] [PMID]

Farren, J., et al., 2018. The psychological impact of early pregnancy loss. *Human Reproduction Update,* 24(6), pp. 731-49. [DOI:10.1093/humupd/dmy025] [PMID]

Fok, W. Y., Siu, S. S. & Lau, T. K., 2006. Sexual dysfunction after a first trimester induced abortion in a Chinese population. *European Journal of Obstetrics & Gynecology and Reproductive Biology,* 126(2), pp. 255-8. [DOI:10.1016/j.ejogrb.2005.10.031] [PMID]

Francisco, M.deF., et al., 2014. [Sexuality and depression among pregnant women with recurrent spontaneous abortion (Portuguese)]. *Revista Brasileira de Ginecologia e Obstetrícia,* 36(4), pp. 152-6. [DOI:10.1590/S0100-720320140050.0004] [PMID]

Ghiasi, A. & Keramat, A., 2018. Prevalence of sexual dysfunction among reproductive-age women in Iran: A systematic review and meta-analysis. *Journal of Midwifery and Reproductive Health*, 6(3), pp. 1390-304. [DOI:10.22038/JMRH.2018.23708.1256]

Goldfarb, S., Baron, S. R. & Lindau, S. T., 2013. Female sexuality and sexual function. In: M. B. Goldman., R. Troisi. & K. M. Rexrode (eds), Women and health. Amsterdam: Elsevier. [DOI:10.1016/B978-0-12-384978-6.00023-6]

Hamidi Madani, A., et al., 2018. Frequency and correlates of sexual dysfunction among women attending outpatient gynecological Clinics. *Iranian Journal of Health Sciences,* 6(3), pp. 21-35. [DOI:10.18502/jhs.v6i3.194]

He, L., et al., 2019. Prevalence of depression and anxiety in women with recurrent pregnancy loss and the associated risk factors. *Archives of Gynecology and Obstetrics,* 300(4), pp. 1061-6. [DOI:10.1007/s00404-019-05264-z] [PMID]

Jamali, S. & Mosalanejad, L., 2013. Sexual dysfnction in Iranian pregnant women. *Iranian Journal of Reproductive Medicine,* 11(6), pp. 479–86. [PMID]

Kicia, M., et al., 2015. Anxiety and stress in miscarriage. *Polish Journal of Public Health,* 125(3), pp. 162-5. [DOI:10.1515/pjph-2015-0046]

Kolte, A. M., et al., 2015. Depression and emotional stress is highly prevalent among women with recurrent pregnancy loss. *Human Reproduction,* 30(4), pp. 777-82. [PMID] [PMCID]

Lewis, J. A. & Black, J. J., 2006. Sexuality in women of childbearing age. *The Journal of Perinatal Education,* 15(2), pp. 29-35. [PMCID]

Major, B., et al., 2009. Abortion and mental health: Evaluating the evidence. *The American Psychologist,* 64(9), pp. 863–90. [DOI:10.1037/a0017497] [PMID]

Mccool-Myers, M., et al., 2018. Predictors of female sexual dysfunction: A systematic review and qualitative analysis through gender inequality paradigms. *BMC Women's Health,* 18(1), pp. 108. [DOI:10.1186/s12905-018-0602-4] [PMID] [PMCID]

Mintz, L. B., et al., 2012. Bibliotherapy for low sexual desire: Evidence for effectiveness. *Journal of Counseling Psychology,* 59(3), pp. 471–8. [DOI:10.1037/a0028946] [PMID]

Mohammadi, K., Heydari, M. & Faghihzadeh, S., 2008. [The female sexual function index (FSFI): Validation of the Iranian version (Persian)]. *Payesh*, 7(3), pp. 269-78. [Link]

Neijenhuijs, K. I., et al., 2019. The female sexual function index (FSFI)-a systematic review of measurement properties. *The Journal of Sexual Medicine,* 16(5), pp. 640–60. [DOI:10.1016/j.jsxm.2019.03.001] [PMID]

Oindi, F. M., et al., 2019. Association of female sexual dysfunction and fertility: A cross sectional study. *Fertility Research and Practice*, 5, pp. 12. [PMID]

Omani-Samani, R., et al., 2019. Prevalence of sexual dysfunction among infertile women in Iran: A systematic review and meta-analysis. *International Journal of Fertility & Sterility,* 12(4), pp. 278–83. [PMID]

Ranjbar, F., et al., 2015. Paradox of modern pregnancy: A phenomenological study of women's lived experiences from assisted pregnancy. *Journal of Pregnancy,* 2015, pp. 543210. [PMID] [PMCID]

Rogers, C. & Dantas, J. A. R., 2017. Access to contraception and sexual and reproductive health information post-abortion: A systematic review of literature from low-and middle-income countries.*The Journal of Family Planning and Reproductive Health Care,* 43(4), pp. 309–18. [DOI:10.1136/jfprhc-2016-101469] [PMID]

Rosen, R., et al., 2000. The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. J*ournal of Sex & Marital Therapy,* 26(2), pp. 191–208. [PMID]

Serati, M., et al., 2010. Female sexual function during pregnancy and after childbirth. *The Journal of Sexual Medicine,* 7(8), pp. 2782–90. [DOI:10.1111/j.1743-6109.2010.01893.x] [PMID]

Serrano, F. & Lima, M. L., 2006. Recurrent miscarriage: Psychological and relational consequences for couples. *Psychology and Psychotherapy,* 79(Pt 4), pp. 585–94. [DOI:10.1348/147608306X96992] [PMID]

Shahraki, Z., Tanha, F. D. & Ghajarzadeh, M., 2018. Depression, sexual dysfunction and sexual quality of life in women with infertility. *BMC Women's Health,* 18(1), pp. 92. [PMID] [PMCID]

Starc, A., et al., 2019. Infertility and sexual dysfunctions: A systematic literature review. *Acta Clinica Croatica,* 58, pp. 508-15. [DOI:10.20471/acc.2019.58.03.15]

Tao, P., Coates, R. & Maycock, B., 2011. The impact of infertility on sexuality: A literature review. *The Australasian Medical Journal,* 4(11), pp. 620–7. [PMID] [PMCID]

Zegers-Hochschild, F., et al., 2009. The international committee for monitoring assisted reproductive technology (ICMART) and the World Health Organization (WHO) revised glossary on ART terminology, 2009. *Human Reproduction,* 24(11), pp. 2683-7. [PMID]

Zhang, Y. X., et al., 2016. Psychological burden, sexual satisfaction and erectile function in men whose partners experience recurrent pregnancy loss in China: A cross-sectional study. *Reproductive Health,* 13(1), pp. 73. [PMID] [PMCID]